



Seminar, Department of Physical Sciences, Bose Institute, Kolkata

Precise measurement of the weak mixing angle by the
MOLLER experiment at Jefferson Lab

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(On behalf of MOLLER experiment)

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Abstract: The MOLLER (Measurement Of Lepton Lepton Electroweak Reaction) experiment at the Thomas Jefferson National Accelerator Facility (JLab), Virginia, USA is aiming to measure the parity-violating asymmetry (A_{pv}) in the electron-electron (Møller) scattering with unprecedented precision. The flux of Møller-scattered electrons from the liquid hydrogen target is measured by Cherenkov detectors and the longitudinal polarization of the incoming electron beam is rapidly flipped to extract the right-left fractional flux difference and thence A_{pv} . The predicted A_{pv} at the MOLLER kinematics is ~ 33 parts per billion (ppb), and the experiment's goal is to measure A_{pv} to an uncertainty of 0.8 ppb. The measurement is sensitive for exploring undiscovered dynamics beyond the Standard Model. Such discovery reach is unmatched by any proposed experiment measuring a flavour and CP-conserving process over the next decade, and results in a unique window to new physics at MeV and multi-TeV scales, complementary to direct searches at high energy colliders. A brief overview of the experimental goals, detector sub-systems and the present status will be presented.

Date/time: November 14, 2023 (Tuesday) at 12:00 noon

Venue: Physics Seminar Room (204, second floor, UAC, BI)